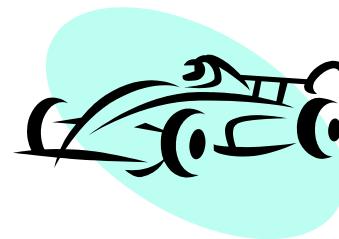


**TAG: Learning Set 1.6**  
**Design and Build**

Name \_\_\_\_\_  
Hour \_\_\_\_\_ Date \_\_\_\_\_

**Revise Your Design**

Read p. 47 and the top of p. 48. What is the difference between a design change and a construction change?



Read the “Be a Scientist” section on pp. 48 and 49. Discuss with your group the two things that design engineers need to look at when something doesn’t work as expected.

Read the top of p. 50 (under “**Redesigning Your Vehicle**”). What does it mean for a drawing to be to scale?

**Procedure:** Read through steps 1-4 (pp. 50-52). As you do the activity, record your data and ideas on the “Redesigning My Vehicle” and “Testing My Design” (one per iteration) pages.

Read step 5 (p. 52), and make a poster including:

- ✓ Each source of friction you reduced, or tried to reduce
- ✓ What you did to reduce each source of friction (Identify each change as a design change or a construction change.)
- ✓ Data from each test, displayed clearly so others can understand the effects of each of your changes
- ✓ A drawing of your final design, as close to scale as possible, with measurements and construction notes
- ✓ Reasons why the car performed as it did
- ✓ A statement about the role you think friction is playing in the motion of your vehicle.



**Communicate:** Read p. 53 and the top of p. 54. As you listen to other groups present, take notes on the “Solution-Briefing Notes” page.

Discuss findings with your class and fill in the following chart:

Question	Coaster 1	Coaster 2	Coaster 3
What is unique about the design of each of these cars that allows them to travel so far?			
What is unique about the design of each of these cars that allows them to travel so straight?			

What is unique about the construction of each of these cars that allows them to travel so far?			
What is unique about the construction of each of these cars that allows them to travel so straight?			
What did the designers of these cars do to reduce the friction in the subsystems of their cars?			
What, if anything, did the designers of these cars do to reduce the friction between the wheels of their cars and the ground?			

**Read “Recommend” on pg. 54-55.**

Choose three ideas that your group believes are the best guidelines for making the coaster car go very far or very straight. For each recommendation, complete one “Create Your Explanation” page with your group.



**Communicate:** Share your recommendations with the class and make a class list.

**Reflect:**

1. Choose one class recommendation that you think is most complete. Describe what makes this recommendation complete.

2. Choose one class recommendation that you think is most convincing. Describe what makes this recommendation convincing.

3. Choose one class recommendation that you think is not as convincing. What else would have to be added to make it more convincing?

4. If you want your car to go still straighter or farther, what else do you need to know?

5. You have focused on making your car travel straight and far. Suppose you want to make your car go faster. What things would you need to know?

**Update the Project Board:** Read the top of pg. 56 and with your class add to your Project Board.

**What's the Point?** Read the bottom of pg. 56. Why did you make only one change at a time with each iteration?